

REMARKS

Paper No. 10, the Official Action mailed January 29, 2003, has been carefully reviewed. The claims in the application are now claims 47-61, and these claims define novel and unobvious subject matter under §§102 and 103, and should be allowed. Applicants accordingly respectfully request favorable reconsideration and allowance.

Claims 1, 3, 4, 5, 7, 8, 41 and 43-46 have been rejected under §102 as anticipated by Nagasawa. Even though the applicants consider Nagasawa to be the closest prior art, the rejection is nevertheless respectfully traversed.

The previously pending claims have been deleted and replaced by a new set of claims focusing first on the method and next on the resultant product. Applicants respectfully submit that Nagasawa does not disclose either applicants' process or the resultant product.

The rejection focuses on column 6, lines 10-22 of the US patent equivalent of Nagasawa with respect to the process, but the process disclosed in Example 3 (column 6, lines 10-22) is a process for forming a starting material or intermediate, and not a process for producing the resultant product. Thus, the process described in the first part of Example 3 of Nagasawa produces nickel p-toluenecarboxylate, an

intermediate or starting material used to produce the resultant ultrafine particles, but **not** (as per applicants' claims) composite metallic ultrafine particles themselves.

While no rejection under §103 is based on Nagasawa, applicants wish to emphasize that applicants' process, starting with an organic compound and a metal compound (not an organometallic compound), goes directly to the desired product. There is no need in accordance with the present invention to prepare an organometallic compound as in Nagasawa. Applicants' process is improved as it is simpler and less expensive than what is taught by Nagasawa.

In other words, a process of producing ultrafine particles of Nagasawa requires first the provision of a stable organometallic compound as a precursor. Therefore, ultrafine particles cannot be produced from an unstable organometallic compound such as alkoxide noble metal, carbonate gold, or carbonate platinum.

According to the present invention, the metal components gather together to form the core metal, and simultaneously the functional group of the organic compound is bonded to a surface of the core metal to form the protective layer made of the organic compound. Therefore, an intermediate metal organic compound is not necessary for a process according to the present invention.

Insofar as applicants' product claims are concerned, Nagasawa discloses ultrafine particles comprising a metal core and a metal compound surrounding the metal core (see col. 2, line 66 - col. 3, line 5).

As shown in Fig. 1 of Nagasawa, a compound is provided which is a combination of a metal atom and an organic material chemically bonded to the metal atom. The resultant organometallic compound is different from an organic compound. Thus, as is apparent from comparison with FIG. 2A of the present application, the structure of ultrafine particles disclosed by Nagasawa is clearly different from the structure of composite metallic ultrafine particles of the present invention.

Further, Nagasawa does not teach or suggest a protective layer made of an organic compound having an alcoholic hydroxyl group. Moreover, Nagasawa does not disclose a product which constitutes a reaction product between the metal compound and the organic compound.

Applicants should add that Nagasawa is somewhat ambiguous. At column 2, lines 25-28, it is indicated that the core is "a metal organic compound", wherein the metal compound surrounds the core. This is of course inconsistent with the disclosure at the top of column 3 which indicates that the core is "substantially composed of said metal component and

surrounded substantially by said metal organic compound." However, even assuming that the latter disclosure is correct and the former disclosure is incorrect, it is nevertheless clear from Nagasawa that the organic component contains some metal component (column 3, lines 11-18). This is also consistent with the disclosure of Fig. 1 of Nagasawa which illustrates the presence of metal in the coating.

Nagasawa does not anticipate any of applicants' claims. Accordingly, applicants respectfully request withdrawal of the rejection.

Claims 1-21, 41 and 43-46 have been rejected under §102 as anticipated by Tomihisa. This rejection is respectfully traversed.

Tomihisa is fundamentally different from the present invention. The reactants are different, the process is different, and the resultant product is different from applicants' respective reactants, process and resultant product.

Tomihisa discloses compound fine particles including inorganic fine particles and an organic polymer bound to surfaces of the inorganic fine particles (see Abstract; col. 6, lines 4-9). Specifically, the core of the fine particle is an inorganic material, but not a core made of a metal. Thus, Tomihisa does not disclose a core metal made of a metal.

According to column 6, lines 13-17 of Tomihisa, "a suitable inorganic matter is an inorganic oxide. The inorganic oxide is defined as an oxygen-containing metallic compound in which a metal element mainly constitutes a three-dimensional network through bonding with an oxygen atom." Thus, although an inorganic fine particle is a metallic compound, it is not a metal¹. Such a metallic compound has a surface having a different reactivity from a surface of a metal. There is no anticipation.

Moreover, one of ordinary skill in the art would not be motivated to replace a core of an inorganic fine particle taught by Tomihisa with a core made of a metal so as to obtain the invention recited in new independent claim 50, as that would fly in the face of Tomihisa which requires the core to be an inorganic oxide, preferably silica.

Withdrawal of the rejection is in order and is respectfully requested.

Claims 1-13, 15-23, 25-27, 29 and 41-46 have been rejected under §102 as anticipated by Murray. This rejection is respectfully traversed.

¹ The rejection states at page 12 that a reducing agent may be present, column 10, lines 46-54. It is speculation that any reduction of the oxide occurs or is intended. The presence of metal as opposed to the intended metal oxide in Tomihisa is not inherent. "Absent a showing [by the PTO] of some reasonable certainty of inherency, the rejection... under 35 USC 102 must fail." *In re Brink*, 164 USPQ 247, 249.

As is clear from review of the Murray abstract, the Murray method is quite different from applicants' process. In Murray, the nanoparticle formation involves first forming a metal precursor solution from a transition metal, then injecting the metal precursor solution into a surfactant solution, then adding a flocculant to cause the nanoparticles to precipitate out of solution. The rejection focuses on column 3, line 6, through column 4, line 28, but nowhere in this extended disclosure of several different methods is applicants' process disclosed. As best understood, in each and every one of the various Murray options, an organometallic compound is formed as an intermediate. Thus, at best, Murray discloses a process which is no closer to applicants' invention (and is actually believed to be farther away from) than the above-discussed Nagasawa method.

Product-wise, Murray discloses nanoparticles coated with a surfactant (e.g. see claim 1). However, Murray does not disclose an organic compound **chemically bound by chemisorption to the surface of the core metal**. Because an organic compound having an alcoholic hydroxyl group is not a surfactant, Murray also does not make obvious the use of an organic compound chemically bound by chemisorption to the surface of the core metal (applicants note that Murray by itself has not been applied under \$103, although it has been

applied against claim 30 in combination with another citation, discussed below).

It is understood that the surfactant is adsorbed onto the surface of the core metal rather than being chemically bound thereto, as there is no indication in Murray of any chemical bonding. Therefore, again, Murray does not show, teach or suggest an alcoholic hydroxyl group of an organic compound **chemically bound** to a surface of a core metal as claimed.

Respectfully, Murray appears to be a far cry from the present invention. Applicants respectfully request withdrawal of the rejection.

Claims 1-12, 22, 23, 25-27, 29 and 41-46 have been rejected under §102 from Leone. The rejection gives the patent number of Funaki. The only Leone patent of record is USP 6,369,206, so applicants assume that this is the prior art intended to be applied. This rejection is respectfully traversed.

The rejection focuses on column 11, lines 1-15 and column 13, lines 1-6. But again, like other prior art discussed above, including Nagasawa, Leone relies upon organometallic compounds (column 11, lines 1-5). Applicants' process is not disclosed.

Moreover, even the coating is quite different. The metal particles are coated with a polymer (paragraph spanning columns 12 and 13).

To summarize, in Leone, a metal acetate for example is reduced under hydrogen and then reacted with thiol. Clearly, the Leone processes are different from the process according to the present invention in which all materials are mixed and reacted.

Product-wise, Leone discloses a metal organothiol particle having a central core and one or more organothiol moieties forming an outer shell covalently linked to the central core (see claim 1). The organothiol moieties is selected from the group consisting of alkyl thiol, aryl thiol, glutathione, thioglucose, mercaptobenzoic acid, nonylmercaptan, thiol benzoic acid, proteins containing thiol, peptides containing thiol, antibodies and antibody fragments containing thiol, and nucleic acids containing thiol (see claim 2). Thus, Leone teaches only organothiol moieties, but not an organic compound having an alcoholic hydroxyl group (or carboxyl, amino, or amide group).

Leone is very different from the present invention. The rejection should be withdrawn and such is respectfully requested.

Claims 1-29 and 41-46 have been rejected under §102 as anticipated by Funaki. The rejection is respectfully traversed.

With respect to the process, the rejection points to column 6, lines 15-30 and column 14, lines 25-41. The disclosure referred to at column 6 appears to be a disclosure of prior art in which a noble metal salt is mixed with a polymer. Applicants see no relation to the present invention. The disclosure at column 14, Example 1-1, discloses mixing an organometallic compound with a polymer, adding a reducing agent, heating to obtain a metallic cluster complex, and evaporating solvent to form a cast polymeric film containing metal clusters. This is quite clearly very different applicants' claimed process in various ways including (again) the use in the prior art of an organometallic compound.

The Funaki method is more generally described at column 4, commencing with line 27. The objective is to produce a metal-organic polymer composite structure. Applicants do not see that Funaki discloses a method even remotely similar to applicants' claimed process.

As concerns the product, it appears that the metal particles are merely embedded in the polymer matrix, i.e. they are bound physically or mechanically, but not chemically (e.g. see column 6, line 63 through column 7, line 8).

Furthermore, Funaki discloses that the number average molecular weight of the polymer is the range of 1,000 to 1,000,000 (column 11, lines 31-34). This is clearly quite different from applicants' product in which the number of carbon atoms is in the range of 4-22.

Funaki does not anticipate any of applicants' claims. Applicants respectfully request withdrawal of the rejection.

Claims 28 and 30 have been rejected as obvious under §103 from Leone. This rejection is respectfully traversed.

Leone differs from the present invention for the reasons pointed out above. The rejection under §103 does not address the aforementioned deficiencies of Leone, and there is nothing in the prior art which would have made it obvious to reconstruct Leone to achieve the subject matter of applicants' claims.

Applicants respectfully request withdrawal of the this rejection.

Claim 30 has also been rejected under §103 as obvious from Funaki in view of Mathiowitz, and also as obvious from Murray in view of Mathiowitz. These rejections are respectfully traversed.

Funaki and Murray are fundamentally deficient for the reasons pointed out above. Mathiowitz has not been cited to make up for those deficiencies, and indeed does not do so. Therefore, even if the proposed combinations were obvious (applicants do not address that point at this stage), the resultant reconstructions would not correspond with the claims subject matter.

Applicants respectfully request withdrawal of these rejections.

Claims 31-40 have been rejected as obvious under §103 from Speakman in view of Danse. This rejection is respectfully traversed.

Presently, applicants are no longer claiming the apparatus or the method for forming an interconnection, i.e. these claims have been deleted at least temporarily, applicants respectfully reserving the right to pursue such subject matter in a continuing application without any penalty whatsoever, applicants relying on their rights including those provided by §§120 and 119.

As corresponding claims no longer are pending, this rejection is no longer applicable.

With respect, applicants must protest the citation and application of so many references, thereby creating a

burden on the applicants. In this regard, applicants respectfully refer to MPEP 706.02 under the heading "**CHOICE OF PRIOR ART; BEST AVAILABLE**" appearing at page 700-20 (August 2001) which states that, in general

Prior art rejections should ordinarily be confined strictly to the best available art.

... Merely cumulative rejections, i.e., those which would clearly fall if the primary rejection were not sustained, should be avoided.

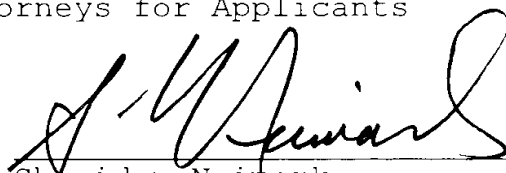
The PTO should apply only the "nearest" prior art, MPEP 707.05.

Applicants respectfully request favorable reconsideration and allowance.

Respectfully submitted,

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